Mingyi Hong

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University of Minnesota
Dept. of Electrical and Computer Engineering
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EDUCATION

Ph.D., Systems Engineering — **University of Virginia, 2011**
Advisor: **Alfredo Garcia**

M. A. Sc., Electrical Engineering — **Stony Brook University, 2007**
Advisors: **Petar Djurić** and **Monica Bugallo**

B. Eng., Electrical Engineering — **Zhejiang University, 2005**

ACADEMIC EMPLOYMENT

University of Minnesota — **8/2017–Present**
Assistant Professor
Dept. of Electrical and Computer Engineering

Iowa State University — **8/2014–7/2017**
Assistant Professor
Dept. of Industrial and Manufacturing Systems Engineering
Dept. of Electrical and Computer Engineering (by courtesy)

University of Minnesota — **7/2011–8/2014**
Post-Doctoral Fellow and Research Assistant Professor
Dept. of Electrical and Computer Engineering

HORNORS AND AWARDS

1. The Black & Veatch Faculty Fellow, Iowa State University, 2014-2017
2. Finalist, Best Paper Prize for Young Researchers in Continuous Optimization, the Mathematical Optimization Society 2013, 2016

FUNDED PROJECT

1. **PI,** "Decomposition Framework for Non-convex Nonsmooth Optimization with Applications in Data Analytics", NSF, Grant No. CMMI-1727757, 2017-2021, $426,765 out of total $426,765
2. **PI,** "Optimal Provision of Backhaul and Radio Access Networks: A Cross-Network Approach", NSF, Grant No. CCF-1526078, 2015-2018, $180,000 out of total $490,000 (Collaborative with UMN)
3. **PI,** "Mechanism Design for Complex Systems: A Black-box Model Approach", Air Force Office of Scientific Research (AFOSR), Grant No. 15RT0767, 2015-2019, $200,000 out of total $453,000 (Collaborative with UFL)
4. **Subcontract,** "Distributed Inverter Controllers Seeking Reliability and Economic-Optimality of Photovoltaic-Dominant Distribution Systems", National Renewable Energy Lab (NREL) LDRD Program, 2015-2017, $90,000 out of total $454,000
5. **PI**, Black & Veatch Faculty Fellow, Iowa State University, 2014 - 2017, $21,000

TEACHING

1. Fall 2017, *EE 5239 Nonlinear Programming*
2. Spring 2017, *IE 631 Nonlinear Programming*
3. Fall 2016, 2014, *IE 312 Optimization*
4. Spring 2016, 2015, *IE 487/587 Big Data Optimization*
5. Fall 2015, *IE 341 Production System*

PATENTS

1. N. Zhang, W.-C. Liao, M. Hong, H. Farmanbar, Z.-Q. Luo, "Systems and methods for performing traffic engineering in a communications network", US Patent Application 5138973
2. R. Sun, **M. Hong**, M. Baligh, Z.-Q. Luo, M. Razaviyayn, "System and Method for Transmission Point (TP) Association and Beamforming Assignment in Heterogeneous Networks", US 20130201937 A1
3. W.-C. Liao, **M. Hong**, Z.-Q. Luo, H. Farmanbar, X. Li, H. Zhang, "System and Method for Joint Power Allocation and Routing for Software Defined Networks", US 20150119050
4. N. Zhang, W.-C. Liao, **M. Hong**, H. Baligh and Z.-Q. Luo, "Systems and Methods for Performing Traffic Engineering In a Communications Network", International Patent Application No. PCTIB2016051777

SELECTED PUBLICATIONS BY AREA

Mathematical Optimization

- **Mingyi Hong**, "Decomposing Nonconvex Problems Using a Proximal Primal-Dual Approach: Algorithms, Convergence, and Applications", preprint, available at `https://arxiv.org/abs/1604.00543`, 2016
- **Mingyi Hong**, "A Distributed, Asynchronous and Incremental Algorithm for Nonconvex Optimization: An ADMM Based Approach", accepted, **IEEE Transactions on Control of Network Systems**, available at `http://xxx.tau.ac.il/pdf/1412.6058v1.pdf`, 2015
- Ruoyu Sun and **Mingyi Hong**, "Improved Iteration Complexity Bounds of Cyclic Block Coordinate Descent for Convex Problems," preprint, available at `http://arxiv.org/abs/1512.04680`, 2015
- **Mingyi Hong** and Zhi-Quan Luo, "On the Linear Convergence of the Alternating Direction Method of Multipliers", accepted, **Mathematical Programming Series A** [Online] `http://arxiv.org/abs/1208.3922`, 2016
- **Mingyi Hong**, Xiangfeng Wang, Meisam Razaviyayn and Zhi-Quan Luo, "Iteration Complexity Analysis of Block Coordinate Descent Methods", accepted, **Mathematical Programming Series A** [Online] `http://arxiv.org/abs/1310.6957`, 2016
- **Mingyi Hong**, Zhi-Quan Luo and Meisam Razaviyayn, "Convergence Analysis of Alternating Direction Method of Multipliers for a Family of Nonconvex Problems", **SIAM Journal on Optimization**, Vol. 26, No. 1, pages 337 - 364, 2016; **Finalist, Best Paper Prize for Young Researchers in Continuous Optimization, 2016**
- Meisam Razaviyayn, **Mingyi Hong** and Zhi-Quan Luo, "A Unified Convergence Analysis of Block Successive Minimization Methods for Nonsmooth Optimization", **SIAM Journal on Optimization**. Vol. 23, No. 2, pages 1126 - 1153, 2013; **Finalist, Best Paper Prize for Young Researchers in Continuous Optimization, 2013**
- Zi Xu, **Mingyi Hong**, and Zhi-Quan Luo, "Semidefinite approximation for mixed binary quadratically constrained quadratic programs", **SIAM Journal on Optimization**, Vol. 24, No. 3, pages, 1265 - 1293, 2014

Machine Learning & Data Analytics

- Xiao Fu, Kejun Huang, Nicholas D. Sidiropoulos, Qingjiang Shi and **Mingyi Hong**, "Anchor-Free Correlated Topic Modeling", accepted **IEEE Transactions on Pattern Analysis and Machine Intelligence**, 2018.
- Bo Yang, Xiao Fu, Nicholas D. Sidiropoulos and **Mingyi Hong**, "Towards K-means-friendly Spaces: Simultaneous Deep Learning and Clustering", **Proc. ICML 2017**.

- Xiao Fu, Kejun Huang, **Mingyi Hong**, Nicholas D. Sidiropoulos, and Anthony Man-Cho So. "Scalable and Optimal Generalized Canonical Correlation Analysis via Alternating Optimization", accepted, **IEEE Transactions on Signal Processing**, available at `http://arxiv.org/abs/1605.09459`, March 2017.
- Xingguo Li, Jarvis Haupt, Raman Arora, Han Liu, **Mingyi Hong**, Tuo Zhao, "A First Order Free Lunch for SQRT-Lasso", manuscript, available at `http://arxiv.org/abs/1605.07950`, May 2016
- **Mingyi Hong***, Meisam Razaviyayn*, Zhi-Quan Luo and Jong-Shi Pang, "A Unified Algorithmic Framework for Block-Structured Optimization Involving Big Data", **Feature Article**, **IEEE Signal Processing Magazine** (*equal contribution), Vol. 33, No. 1, pages 57 - 77, Jan. 2016
- Davood Hajinezhad, **Mingyi Hong**, Tuo Zhao and Zhaoran Wang, "NESTT: A Nonconvex Primal-Dual Splitting Method for Distributed and Stochastic Optimization", **Proc. NIPS 2016**, **(acceptance rate 22.7%)**
- Ruoyu Sun* and **Mingyi Hong***, "Improved Iteration Complexity Bounds of Cyclic Block Coordinate Descent for Convex Problems", **Proc. NIPS 2015** (*equal contribution, **acceptance rate %21.92**)
- Meisam Razaviyayn, **Mingyi Hong**, Zhi-Quan Luo and Jong-Shi Pang, "Parallel Successive Convex Approximation for Nonsmooth Nonconvex Optimization", **Proc. NIPS 2014**, (**acceptance rate %24.67**)

Signal and Information Processing

- Qingjiang Shi, Haoran Sun, Songtao Lu, **Mingyi Hong** and Meisam Razaviyayn, "Inexact Block Coordinate Descent Methods For Symmetric Nonnegative Matrix Factorization", accepted, **IEEE Transactions on Signal Processing**; available at `http://arxiv.org/abs/1607.03092`, 2016
- Alfredo Garcia and **Mingyi Hong**, "Efficient Rate Allocation in Wireless Networks Under Incomplete Information", **IEEE Transactions on Automatic Control**, Vol. 61, No. 5, pages 1397 - 1402, 2016
- Tsung-Hui Chang, **Mingyi Hong** and Xiangfeng Wang, "Multi-Agent Distributed Optimization via Inexact Consensus ADM", **IEEE Transactions on Signal Processing**, Vol. 63, No. 2, pages 482-497, 2015
- M. Baligh, **M. Hong**, W.-C Liao, Z.-Q Luo, M. Razaviyayn, M. Sanjabi, and R. Sun, "Cross-Layer Provisioning of Future Cellular Networks", **IEEE Signal Processing Magazine**, special issue on 5G revolution, Vol. 31, No. 6, pages 56-68, 2014
- **Mingyi Hong**, Ruoyu Sun, Hadi Baligh and Zhi-Quan Luo, "Joint Base Station Clustering and Beamformer Design for Partial Coordinated Transmission in Heterogeneous Networks", **IEEE Journal on Selected Areas in Communications**, special issues on Large-Scale multiple antenna systems, Vol. 31, No. 2, pages 226-240, 2013

FULL PUBLICATIONS

Book Chapters

1. **Mingyi Hong** and Zhi-Quan Luo, "Signal Processing and Optimal Resource Allocation for the Interference Channel", **Academic Press Library in Signal Processing**, Elsevier, 2013
2. **Mingyi Hong**, Wei-Cheng Liao, Ruoyu Sun and Zhi-Quan Luo, "Optimization Algorithms for Big Data with Application in Wireless Networks", **Big Data Over Networks**, Cambridge University Press, 2014

Journal Papers (Submitted/Under review)[1]

[1] * denotes student author, ** denotes post-doctoral author.

1. M. Razaviyayn, **M. Hong**, N. Reyhanian and Z.-Q. Luo, "A Doubly Stochastic Gauss-Seidel Algorithm for Solving Linear Equations and Certain Convex Minimization Problems", submitted for publication, May 2018
2. Haoran Sun* and **Mingyi Hong**, "Distributed Non-Convex First-Order Optimization and Information Processing: Lower Complexity Bounds and Rate Optimal Algorithms", Apr., 2018;
3. Charilaos I. Kanatsoulis, Xiao Fu, Nicholas D. Sidiropoulos and **Mingyi Hong**, "Structured SUMCOR Multiview Canonical Correlation Analysis for Large-Scale Data", submitted for publication. Dec. 2017
4. Qingjiang Shi ** and **Mingyi Hong**, "Penalty Dual Decomposition Method For Nonsmooth Nonconvex Optimization—Part I: Algorithms and Convergence Analysis", submitted for publication, Dec. 2017
5. Qingjiang Shi**, **Mingyi Hong**, Xiao Fu and Tsung-Hui Chang, "Penalty Dual Decomposition Method For Nonsmooth Nonconvex Optimization—Part II: Applications", submitted for publication, Dec. 2017
6. Davood Hajinezhad* and **Mingyi Hong**, "Perturbed Proximal Primal Dual Algorithm for Nonconvex Nonsmooth Optimization", submitted for publication, Nov. 2017.
7. Haoran Sun*, Xiangyi Chen*, Qingjiang Shi**, **Mingyi Hong**, Xiao Fu, and Nicholas D. Sidiropoulos, "Learning to Optimize: Training Deep Neural Networks for Wireless Resource Management" submitted for publication, available at `https://arxiv.org/abs/1705.09412`.
8. Tsung-Hui Chang, **Mingyi Hong** and Jong-Shi Pang, "Local Minimizers and Second-Order Conditions in Composite Piecewise Programming via Directional Derivatives", submitted for publication, Sept. 2017
9. Davood Hajinezhad*, **Mingyi Hong** and Alfredo Garcia, "Zeroth Order Nonconvex Multi-Agent Optimization over Networks", submitted for publication, Mar. 2017
10. Xingguo Li, Jarvis Haupt, Raman Arora, Han Liu, **Mingyi Hong**, Tuo Zhao, "A First Order Free Lunch for SQRT-Lasso", submitted for publication, available at `http://arxiv.org/abs/1605.07950`, 2016
11. Ruoyu Sun and **Mingyi Hong**, "Improved Iteration Complexity Bounds of Cyclic Block Coordinate Descent for Convex Problems," submitted for publication, available at `http://arxiv.org/abs/1512.04680`, 2015
12. **Mingyi Hong**, Tsung-Hui Chang, Xiangfeng Wang, Meisam Razaviyayn , Shiqian Ma and Zhi-Quan Luo, "A Block Successive Upper Bound Minimization Method of Multipliers for Linearly Constrained Convex Optimization", submitted for publication, available at `http://www.optimization-online.org/DB_HTML/2014/01/4215.html`, 2014

Journal Papers (Published/Accepted)

1. Qingjiang Shi**, and **Mingyi Hong**, "Spectral Efficiency Optimization For Millimeter Wave Multi-User MIMO Systems", accepted, **IEEE Journal on Selected Topics in Signal Processing**, 2018.
2. Xiao Fu, Kejun Huang, Nicholas D. Sidiropoulos, Qingjiang Shi** and **Mingyi Hong**, "Anchor-Free Correlated Topic Modeling", **IEEE Transactions on Pattern Analysis and Machine Intelligence**, 2018.
3. Nan Zhang, Ya-Feng Liu, Hamid Farmanbar, Tsung-Hui Chang, **Mingyi Hong**, and Zhi-Quan Luo, "Network Slicing for Service-Oriented Networks Under Resource Constraints", accepted by **IEEE Journal on Selected Areas in Communication**, Special issue on Emerging Technologies in Software-Driven Communication Aug. 2017.

4. Wei-Cheng Liao, **Mingyi Hong**, Hamid Farmanbar, and Zhi-Quan Luo, "A Distributed Semi-Asynchronous Algorithm for Network Traffic Engineering" accepted, **IEEE Transactions on Signal and Information Processing over Networks**, 2017.
5. Qingjiang Shi**, Haoran Sun*, Songtao Lu*, **Mingyi Hong** and Meisam Razaviyayn, "Inexact Block Coordinate Descent Methods For Symmetric Nonnegative Matrix Factorization", **IEEE Transactions on Signal Processing**, Vol. 65, No. 22, pp. 5995-6008, Nov., 2017
6. Songtao Lu*, **Mingyi Hong** and Zhengdao Wang, "A Nonconvex Splitting Method for Symmetric Nonnegative Matrix Factorization: Convergence Analysis and Optimality", **IEEE Transactions on Signal Processing**, Vol. 65, No. 12, pp. 3120-3135, June, 2017.
7. Xiao Fu, Kejun Huang, **Mingyi Hong**, Nicholas D. Sidiropoulos, and Anthony Man-Cho So. "Scalable and Optimal Generalized Canonical Correlation Analysis via Alternating Optimization", **IEEE Transactions on Signal Processing**, Vol. 65, No. 16, pp. 4150-4165, Aug. 2017.
8. Yijian Zhang*, **Mingyi Hong**, Emiliano Dall'Anese, Sairaj Dhople, and Zi Xu, "Distributed Controllers Seeking AC Optimal Power Flow Solutions Using ADMM", accepted, **IEEE Transactions on Smart Grid**, 2017
9. **Mingyi Hong**, "A Distributed, Asynchronous and Incremental Algorithm for Nonconvex Optimization: An ADMM Based Approach", accepted, **IEEE Transactions on Control of Network Systems**, available at `http://xxx.tau.ac.il/pdf/1412.6058v1.pdf`, 2016
10. **Mingyi Hong** and Tsung-Hui Chang, "Stochastic Proximal Gradient Consensus Over Random Networks", accepted, **IEEE Transactions on Signal Processing**, Vol. 65, No. 11, pages 2933-2948, 2017
11. Mingmin Zhao, Yunlong Cai, Qingjiang Shi**, **Mingyi Hong**, and Benoit Champagne, "Joint Transceiver Designs for Full-Duplex K-Pair MIMO Interference Channel with SWIPT", **IEEE Transactions on Communication**, Vol. 65, No. 2, pages 890-905, 2017
12. **Mingyi Hong** and Zhi-Quan Luo, "On the Linear Convergence of the Alternating Direction Method of Multipliers", **Mathematical Programming Series A**, Vol. 162, No.1, pages 165–199, 2017
13. **Mingyi Hong**, Xiangfeng Wang, Meisam Razaviyayn and Zhi-Quan Luo, "Iteration Complexity Analysis of Block Coordinate Descent Methods", **Mathematical Programming Series A** Vol. 163, No. 1, pages 85 - 114, 2017
14. Qingjiang Shi**, **Mingyi Hong**, Enbin Song, Yunlong Cai, Weiqiang Xu, Xiqi Gao, "Joint Source-Relay Design for Full–Duplex MIMO AF Relay Systems", **IEEE Transactions on Signal Processing**, Vol. 64, No. 23, pages 6118-6131, 2016
15. Ya-Feng Liu, **Mingyi Hong** and Enbin Song, "Sample Approximation Based Deflation Approaches for Chance Constrained Joint Power and Admission Control", **IEEE Transactions on Wireless Communication**, Vol. 15, No. 7, pages 4535 - 4547, 2016
16. Tsung-Hui Chang, **Mingyi Hong** and Xiangfeng Wang, "Asynchronous Distributed ADMM for Large-Scale Optimization- Part I: Algorithm and Convergence Analysis", **IEEE Transactions on Signal Processing**, Vol. 64, No. 12, pages 3118 - 3130, 2016
17. Tsung-Hui Chang, Wei-Cheng Liao, **Mingyi Hong** and Xiangfeng Wang, "Asynchronous Distributed ADMM for Large-Scale Optimization- Part II: Linear Convergence Analysis and Numerical Performance", **IEEE Transactions on Signal Processing**, Vol. 64, No. 12, pages 3131 - 3144, 2016
18. Brendan Ames and **Mingyi Hong**, "Alternating direction method of multipliers for sparse zero-variance discriminant analysis and principal component analysis", **Computational Optimization and Applications**, Vol. 64, No. 3, pages 725-754, 2016

19. **Mingyi Hong**, Zhi-Quan Luo and Meisam Razaviyayn, "Convergence Analysis of Alternating Direction Method of Multipliers for a Family of Nonconvex Problems", **SIAM Journal on Optimization**, Vol. 26, No. 1, pages 337 - 364, 2016; **Finalist, Best Paper Prize for Young Researchers in Continuous Optimization, 2016**

20. Qingjiang Shi, Meisam Razaviyayn **Mingyi Hong**, and Zhi-Quan Luo, "SINR Constrained Beamforming for a MIMO Multi-user Downlink System", **IEEE Transactions on Signal Processing**, Vol. 64, No. 11, pages 2920-2933, 2016

21. **Mingyi Hong**, Qiang Li and Ya-Feng Liu, "Decomposition by Successive Convex Approximation: A Unifying Approach for Linear Transceiver Design in Heterogeneous Networks", **IEEE Transactions on Wireless Communication**, No. 15, Vol. 2, pages 1377-1392, 2016

22. **Mingyi Hong**†, Meisam Razaviyayn†, Zhi-Quan Luo and Jong-Shi Pang, "A Unified Algorithmic Framework for Block-Structured Optimization Involving Big Data", **Feature Article**, **IEEE Signal Processing Magazine** (†equal contribution), Vol. 33, No. 1, pages 57 - 77, Jan. 2016

23. Qingjiang Shi, Cheng Peng, Weiqiang Xu, **Mingyi Hong**, Yunlong Cai, "Energy Efficiency Optimization For MISO SWIPT Systems With Zero-Forcing Beamforming", **IEEE Transactions on Signal Processing**, Vol. 64, No. 4 pages 842-854, 2016

24. Alfredo Garcia and **Mingyi Hong**, "Efficient Rate Allocation in Wireless Networks Under Incomplete Information", **IEEE Transactions on Automatic Control**, Vol. 61, No. 5, pages 1397 - 1402, 2016

25. Ruoyu Sun, **Mingyi Hong** and Zhi-Quan Luo, "Joint Downlink Base Station Association and Power Control for Max-Min Fairness Computation and Complexity", **IEEE Journal on Selected Areas of Communications**, Vol. 33, No. 6, pages 1040-1054, 2015

26. Xiangfeng Wang, **Mingyi Hong**, Shiqian Ma, Zhi-Quan Luo, "Solving Multiple-Block Separable Convex Minimization Problems Using Two-Block Alternating Direction Method of Multipliers", **Pacific Journal on Optimization**, Vol. 11, No. 4, pages 645 - 667, 2015

27. Zi Xu and **Mingyi Hong**, "Approximation Algorithm for A Mixed Binary Quadratically Constrained Quadratic Programming Problem", **Pacific Journal on Optimization**, Vol. 11, No. 2, pages 239 - 255, 2015 (invited)

28. Tsung-Hui Chang, **Mingyi Hong** and Xiangfeng Wang, "Multi-Agent Distributed Optimization via Inexact Consensus ADM", **IEEE Transactions on Signal Processing**, Vol. 63, No. 2, pages 482-497, 2015

29. M. Baligh, **M. Hong**, W.-C Liao, Z.-Q Luo, M. Razaviyayn, M. Sanjabi, and R. Sun, "Cross-Layer Provisioning of Future Cellular Networks", **IEEE Signal Processing Magazine**, special issue on 5G revolution, Vol. 31, No. 6, pages 56-68, 2014

30. Wei-Cheng Liao, **Mingyi Hong**, Hamid Farmanba, Xu Li, Zhi-Quan Luo and Hang Zhang, "Min Flow Rate Maximization for Software Defined Radio Access Networks", **IEEE Journal on Selected Areas in Communication**, special issue on 5G wireless networks, Vol. 23, No. 6, pages 1282-1294, 2014

31. Shuai Ma, **Mingyi Hong**, Enbin Song, Xiangfeng Wang and Dechun Sun, "Outage Constrained Robust Secure Transmission for MISO Wiretap Channel", **IEEE Transactions on Wireless Communications**, Vol. 13, No. 10, pages 5558-5570, 2014

32. J. Joaquin Escudero Garzas, **Mingyi Hong**, Alfredo Garcia, and Ana Garcia-Armada, "Interference Pricing Mechanism for Downlink Multicell Coordinated Beamforming", **IEEE Transactions on Communications**, Vol. 62, No. 6, pages 1871-1883, 2014

33. Zi Xu, **Mingyi Hong**, and Zhi-Quan Luo, "Semidefinite approximation for mixed binary quadratically constrained quadratic programs", **SIAM Journal on Optimization**, Vol. 24, No. 3, pages, 1265 - 1293, 2014

34. Wei-Cheng Liao, **Mingyi Hong**, Ya-Feng Liu and Zhi-Quan Luo, "Base Station Activation and Linear Transceiver Design for Optimal Resource Management in Heterogeneous Networks", **IEEE Transactions on Signal Processing**, Vol. 62, No. 15, pages 3939 - 3952, 2014

35. Meisam Razaviyayn, **Mingyi Hong** and Zhi-Quan Luo, "A Unified Convergence Analysis of Block Successive Minimization Methods for Nonsmooth Optimization", **SIAM Journal on Optimization**. Vol. 23, No. 2, pages 1126 - 1153, 2013; **Finalist, Best Paper Prize for Young Researchers in Continuous Optimization, 2013**

36. Qiang Li, **Mingyi Hong**, Hoi-To Wai, Wing-Kin Ma, Ya-Feng Liu, and Zhi-Quan Luo, "Transmit Solutions for MIMO Wiretap Channels using Alternating Optimization and Water-Filling", **IEEE Journal on Selected Areas in Communications**, special issues on Signal Processing Techniques for Wireless Physical Layer Security. Vol. 31, No. 9, pages 1714-1727, 2013

37. **Mingyi Hong**, Zi Xu, Meisam Razaviyayn, and Zhi-Quan Luo, "Joint User Grouping and Linear Virtual Beamforming: Complexity, Algorithms and Approximation Bounds", **IEEE Journal on Selected Areas in Communications**, special issues on virtual MIMO systems, Vol. 31, No. 10, pages 2013 - 2027, 2013

38. Meisam Razaviyayn, **Mingyi Hong** and Zhi-Quan Luo, "Linear Transceiver Design for a MIMO Interfering Broadcast Channel Achieving Max-Min Fairness", **Signal Processing**, special issue on sensor array processing, Vol. 93, No. 12, pages 3327 - 3340, 2013

39. **Mingyi Hong**, Alfredo Garcia, Jorge Barrera and Stephen Wilson, "Joint Access Point Selection and Power Allocation for Uplink Wireless Networks", **IEEE Transactions on Signal Processing**, Vol. 61, No. 13, pages 3334-3347, 2013

40. **Mingyi Hong** and Zhi-Quan Luo,"Distributed Linear Precoder Optimization and Base Station Selection for an Uplink Heterogeneous Network", **IEEE Transactions on Signal Processing**, Vol. 61, No. 12, pages 3214–3228, 2013

41. **Mingyi Hong**, Ruoyu Sun, Hadi Baligh and Zhi-Quan Luo, "Joint Base Station Clustering and Beamformer Design for Partial Coordinated Transmission in Heterogeneous Networks", **IEEE Journal on Selected Areas in Communications**, special issues on Large-Scale multiple antenna systems, Vol. 31, No. 2, pages 226-240, 2013

42. Ya-Feng Liu, **Mingyi Hong**, Yu-Hong Dai, "Max-Min Fairness Linear Transceiver Design Problem for a Multi-User SIMO Interference Channel Is Polynomial Time Solvable", **IEEE Signal Processing Letters**, Vol. 20, No. 1, pages 27-30, 2013

43. Alfredo Garcia, **Mingyi Hong** and Jorge Barrera, "Cap and Trade for Congestion Control", **Dynamic Games and Applications**, Vol. 2, No. 3, pages 280-293, 2012.

44. **Mingyi Hong** and Alfredo Garcia, "Mechanism Design for Base Station Association and Resource Allocation in Downlink OFDMA Network", **IEEE Journal on Selected Areas in Communications**, special issues on Game Theory for Communication Networks, Vol. 30, No. 11, pages 2238-2250, 2012

45. **Mingyi Hong** and Alfredo Garcia, "Averaged Iterative Water Filling Algorithm", **IEEE Transactions on Signal Processing**, Vol.59, No. 5, pages 2448-2454, 2011

46. **Mingyi Hong** and Alfredo Garcia, "Equilbirium Pricing of Interference in Cognitive Radio Networks", **IEEE Transactions on Signal Processing**, Vol. 59, No. 12, pages 6058-6072, 2011

47. **Mingyi Hong**, Monica Bugallo and Petar Djuric, "Joint Model Selection and Parameter Estimation by Population Monte Carlo Simulation", **IEEE Journal of Selected Topics in Signal Processing**, Vol. 4, No. 3, pages 526-539, 2010

Conference Papers

1. Mingyi Hong, Jason D. Lee and Meisam Razaviyayn, "Gradient Primal-Dual Algorithm Converges to Second-Order Stationary Solutions for Nonconvex Distributed Optimization", **Proc. ICML 2018 (acceptance rate %24.9)**
2. Mingyi Hong, Davood Hajinezhad* and Ming-Min Zhao*, "Prox-PDA: The Proximal Primal-Dual Algorithm for Fast Distributed Nonconvex Optimization and Learning Over Networks", **Proc. ICML 2017 (acceptance rate %25.1)**
3. Bo Yang, Xiao Fu, Nicholas D. Sidiropoulos and Mingyi Hong, "Towards K-means-friendly Spaces: Simultaneous Deep Learning and Clustering", **Proc. ICML 2017 (acceptance rate 25.1%)**
4. Davood Hajinezhad*, Mingyi Hong, Tuo Zhao and Zhaoran Wang, "NESTT: A Nonconvex Primal-Dual Splitting Method for Distributed and Stochastic Optimization", **Proc. NIPS 2016**, **(acceptance rate 22.7%)**
5. Chao Hu, Mingyi Hong and Ha-Lim Jeong "On-Board Analysis of Degradation Mechanisms of Lithium-Ion Battery using Differential Voltage Analysis", Proc. ASME IDETCT conference 2016
6. Ming-Min Zhao*, Qingjiang Shi**, Mingyi Hong, Yunlong Cai, Minjian Zhao, "Joint Transceiver Design for Full-Duplex Cloud Radio Access Networks with SWIPT", Proc. WCNC 2017
7. Haoran Sun*, Xiangyi Chen*, Qingjiang Shi**, Mingyi Hong and Xiao Fu, "Learning to Optimize: Training Deep Neural Networks for Wireless Resource Management", Proc. SPAWC 2017
8. Songtao Lu*, Mingyi Hong and Zhengdao Wang, "A Stochastic Nonconvex Splitting Method for Symmetric Nonnegative Matrix Factorization", **Proc. AISTATS 2017 (acceptance rate %31.6)**
9. Xiao Fu, Kejun Huang, Mingyi Hong, Nicholas D. Sidiropoulos, Anthony Man-Cho So, "Scalable and Flexible MAX-VAR Generalized Canonical Correlation Analysis via Alternating Optimization", Proc. ICASSP 2017
10. Qingjiang Shi and Mingyi Hong, "Penalty Dual Decomposition Method With Its Application in Signal Processing", Proc. ICASSP 2017
11. Songtao Lu*, Mingyi Hong and Zhengdao Wang, "A Nonconvex Splitting Method for Symmetric Nonnegative Matrix Factorization", Proc. ICASSP 2017
12. Xingguo Li, Tuo Zhao, Raman Aurora, Han Liu and Mingyi Hong, "An Improved Convergence Analysis of Cyclic Block Coordinate Descent-type Methods for Strongly Convex Minimization", **Proc. AISTATS 2016**, **(acceptance rate 30.7%)**
13. Shengyu Zhu, Mingyi Hong, Biao Chen, "Quantized Consensus ADMM for Multi-Agent Distributed Optimization", Proc. ICASSP 2016
14. Qingjiang Shi, Mingyi Hong, Enbin Song, Yunlong Cai, Weiqiang Xu, "A Penalty-BSUM approach for rate optimization in Full-Duplex MIMO Relay Networks with Relay Processing Delay", Proc. ICASSP 2016
15. Davood Hajinezhad*, Tsung-Hui Chang, Xiangfeng Wang, Qinagjiang Shi, Mingyi Hong, "Nonnegative Matrix Factorization using ADMM: Algorithm and Convergence Analysis", Proc. ICASSP 2016
16. Tsung-Hui Chang, Mingyi Hong, Wei-Cheng Liao, Xiangfeng Wang, "Asynchronous Distributed Alternating Direction Method of Multipliers: Algorithm and Convergence Analysis", Proc, ICASSP 2016
17. Davood Hajinezhad* and Mingyi Hong, "Nonconvex Alternating Direction Method of Multipliers for Distributed Sparse Principal Component Analysis", Proc. GlobalSIP 2015

18. Ruoyu Sun† and Mingyi Hong†, "Improved Iteration Complexity Bounds of Cyclic Block Coordinate Descent for Convex Problems", **Proc. NIPS 2015** (†equal contribution, **acceptance rate %21.92**)
19. Wei-Cheng Liao, Mingyi Hong, Ivo Merks, Tao Zhang and Zhi-Quan Luo, "Incorporating Spatial Information into Optimal Binaural Noise Supression Design for Hearing Adis", Proc. ICASSP 2015
20. Hung-Wei Tseng, Mingyi Hong and Zhi-Quan Luo, "Combining Sparse NMF with Deep Neural Network: A New Classification Based Approach for Speech Enhancement", Proc. ICASSP 2015
21. Wei-Cheng Liao, Mingyi Hong, Hamid Farmanbar and Zhi-Quan Luo, "Semi-Asynchronous Routing for Large-Scale Hierarchical Networks", Proc. ICASSP 2015
22. Mingyi Hong, Zhi-Quan Luo and Meisam Razaviyayn, "Convergence Analysis of Alternating Direction Method of Multipliers for a Family of Nonconvex Problems", Proc. ICASSP 2015
23. Meisam Razaviyayn, Mingyi Hong, Zhi-Quan Luo and Jong-Shi Pang, "Parallel Successive Convex Approximation for Nonsmooth Nonconvex Optimization", **Proc. NIPS 2014**, (**acceptance rate %24.67**)
24. Mingyi Hong and Hao Zhu, "Power-Efficient Operation of Wireless Heterogeneous Networks using Smart Grids", Proc. SmartGridComm, 2014
25. Mazair Sanjabi, Mingyi Hong, Meisam Razaviyayn and Zhi-Quan Luo, "Joint Base Station Clustering and Beamformer Design for Partial Coordinated Transmission using Statistical Channel State Information", Proc. SPAWC 2014
26. Tsung-Hui Chang, Mingyi Hong and Xiangfeng Wang, "Multi-agent Distributed Large-Scale Optimization by Inexact Consensus Alternating Direction Method of Multipliers", Proc. ICASSP 2014
27. Mingyi Hong, Tsung-Hui Chang, Xiangfeng Wang, Meisam Razaviyay and Shiqian Ma, Zhi-Quan Luo, "A Block Coordinate Descent Method of Multipliers: Convergence Analysis and Applications", Proc. ICASSP 2014
28. Xiangfeng Wang, Mingyi Hong, Tsung-Hui Chang, Meisam Razaviyany, Zhi-Quan Luo, "Joint Day-Ahead Power Procurement and Load Scheduling Using Stochastic Alternating Direction Method of Multipliers", Proc. ICASSP 2014
29. Wei-Cheng Liao, Mingyi Hong and Zhi-Quan Luo, "Max-Min Network Flow and Resource Allocation for Backhaul Constrained Heterogeneous Wireless Networks", Proc. ICASSP 2014
30. Hung-Wei Tseng, Srikanth Vishnubhotla, Mingyi Hong, Jinjun Xiao, Xiangfeng Wang, Zhi-Quan Luo and Tao Zhang, "A Single Channel Speech Enhancement Approach by Combining Statistical Criterion and Multi-Frame Sparse Dictionary Learning", InterSpeech 2013
31. Wei-Cheng Liao, Mingyi Hong and Zhi-Quan Luo, "Base Station Activation and LinearTransceiver Design for Utility Maximization in Heterogeneous Networks", Proc. ICASSP 2013
32. Shu-Hsien Chu, Mingyi Hong, Zhi-Quan Luo, Kelly Fitz, Martin McKinney, Tao Zhang, "Derivative-Free Optimization Of Hearing Aid Parameters", Proc. ICASSP 2013
33. Qiang Li, Mingyi Hong, Hoi-To Wai, Wing-Kin Ma, Ya-Feng Liu and Zhi-Quan Luo, "An AlternatingOptimization Algorithm for the MIMO Secrecy Capacity Problem under Sum Power Power and Per-Antenna Power Constraint", Proc. ICASSP 2013
34. Hung-Wei Tseng, Srikanth Vishnubhotla, Mingyi Hong, Jinjun Xiao, Zhi-Quan Luo and Tao Zhang, "Single channel speech denoising using Wiener plus dictionary learning approach", Proc. ICASSP 2013

35. Mingyi Hong, Meisam Razaviyayn, Ruo-Yu Sun and Zhi-Quan Luo, "Joint Transceiver Design and Base Station Clustering for Heterogeneous Networks", Proc Asilomar Conference on Signals, Systems and Computers, 2012
36. Qingjiang Shi, Meisam Razaviyayn, Mingyi Hong and Zhi-Quan Luo, "SINR Constrained Beamforming for a MIMO Multi-user Downlink System", Proc. Proc Asilomar Conference on Signals, Systems and Computers, 2012
37. Jorge Barrera, Mingyi Hong and Alfredo Garcia, "Truthful Multi-unit Conflictive Auction For Spectrum", Proc. IEEE Globecome 2013
38. Ruoyu Sun, Mingyi Hong and Zhi-Quan Luo, "Optimal Joint Base Station Assignment and Power Allocation in a Multiuser SISO Network", Proc. IEEE SPAWC 2012
39. Mingyi Hong and Zhi-Quan Luo, "Joint Linear Precoder Optimization and Base Station Selection for an Uplink MIMO Network: A Game Theoretic Approach", Proc. IEEE ICASSP 2012
40. Meisam Razaviyayn, Mingyi Hong and Zhi-Quan Luo, "Linear Transceiver Design for a MIMO Interfering Broadcast Channel Achieving Max-Min Fairness", Proc. Asilomar Conference on Signals Systems and Computers, 2011
41. Mingyi Hong, Alfredo Garcia and Jorge Barrera, "Joint Distributed Access Point Selection and Power Allocation in Cognitive Radio Networks", **Proc. IEEE INFOCOM**, 2011 (**acceptance rate 15.96%**)
42. Zhiheng Xie, Mingyi Hong, Hengchang Liu and John Stankovic, "Quantitative Uncertainty-Based Incremental Localization and Anchor Selection In Wireless Sensor Networks", Proc. ACM MSWiM 2011 (**acceptance rate 30%**)
43. Chenyang Li, Mingyi Hong, Randy Cogill and Alfredo Garcia, "An Adaptive Online Ad Auction Scoring Algorithm for Search Engine Revenue Maximization", INFORMS 2011
44. Mingyi Hong and Alfredo Garcia, Competitive Sharing of the Spetrum in Cognitive Radio Networks: A Market Equilibrium Framework", Proc. IEEE/ACM WiOPT 2010 (**acceptance rate 33.04%**)
45. Monica Bugallo, Mingyi Hong and Petar Djuric, "Marginalized Population Monte Carlo", Proc. IEEE ICASSP 2009

INVITED TALKS

1. "Distributed and Learning Based Methods for Non-convex Optimization and Information Processing", ECE Department, Northwestern University, Jan. 2018
2. "Distributed and Learning Based Methods for Non-convex Optimization and Information Processing", IMA Data Science Seminar, University of Minnesota, Jan. 2018
3. "Distributed and Learning Based Methods for Non-convex Optimization and Information Processing", Chinese University of Hong Kong, Dec. 2017
4. "Learning to Optimize: Training Deep Neural Networks for Fast Wireless Resource Management", INFORMS 2017, Houston, Nov 2017
5. "The Proximal Primal-Dual Approach for Nonconvex Linearly Constrained Problems", 2017 DIMACS Workshop on Distributed Optimization, Information Processing, and Learning, Rutgers University, Aug 2017
6. "Learning to Optimize: Training Deep Neural Networks for Fast Wireless Resource Management", Nokia Machine Learning Workshop, Sept 2017
7. "The Proximal Primal-Dual Approach for Nonconvex Linearly Constrained Problems", Conference on Nonconvex Statistical Learning 2017, University of Southern California
8. "Optimization and Learning for Next Generation Wireless Systems", ECE Department, University of Minnesota, Mar. 2017

9. "Non-Convex Modeling and Computation for Machine Learning and Information Processing", ECE Department, UC Davis, Feb. 2017
10. "Non-Convex Optimization for Data and Information Processing", IE Department,Texas A&M University, Feb. 2017
11. "Recent Advancement in Nonconvex First-Order Primal Dual Methods: From Theory to Applications", Statistical Machine Learning Group, *Princeton University*, August 2016
12. "Does ADMM Converge for Nonconvex Problems?", *ICCOPT 2016, Japan*, August 2016
13. "A Unified Algorithmic Framework for Block-Structured Optimization Involving Big Data", The Department of Automation, *University of Science and Technology of China*, June 2016
14. "Modern first-order methods for large-scale optimization", *Modern Optimization and Application (MOA)*, invited short course, June 2016
15. "Iteration Complexity Analysis of Block Coordinate Descent Method", Math Department, *The University of Alabama*, March 2016
16. "A Unified Algorithmic Framework for Block-Structured Optimization Involving Big Data", ECEE Department, *Arizona State University*, Feburary 2016
17. "A Unified Algorithmic Framework for Block-Structured Optimization Involving Big Data", CS Department, *The Johns Hopkins University*, December 2015
18. "A Unified Algorithmic Framework for Block-Structured Optimization Involving Big Data", CS Department, *University of Iowa*, October 2015
19. "Stochastic Proximal Gradient Consensus Over Time-Varying Multi-Agent Network", *INFORMS*, Philadelphia, 2015
20. "Iteration Complexity Analysis of Block Coordinate Descent Method", *INFORMS*, Philadelphia, 2015
21. "Stochastic Proximal Gradient Consensus Over Time-Varying Multi-Agent Network", *Allerton 2015*
22. "Flexible ADMM for Block-Structured Convex and Nonconvex Optimization", *ICIAM*, Beijing, 2015
23. "A Unified Algorithmic Framework for Block-Structured Optimization Involving Big Data", ISEE Department, *Zhejiang University*, August 2015
24. "Iteration Complexity Analysis of Block Coordinate Descent Method", The State Key Laboratory of Scientific and Engineering Computing, *the Chinese Academy of Sciences*, July, 2015
25. "Convergence Analysis of Alternating Direction Method of Multipliers for a Family of Nonconvex Problems", *ISMP*, Pittsburgh 2015
26. "Flexible ADMM for Block-Structured Convex and Nonconvex Optimization", *University of Houston*, Novemeber, 2014
27. "The Block Successive Upper-Bound Minimization Methods of Multipliers", *INFORMS*, San Francisco, November, 2014
28. "Iteration Complexity Analysis of Block Coordinate Descent Method", *SIAM conference on Optimization*, San Diego, May, 2014
29. "Provision of Next-Generation Wireless Networks: A Large-Scale Optimization Approach", *Oregon State University*, Corvallis, March, 2014
30. "Large-Scale Structured Optimization: Algorithms and Applications", *Iowa State University*, Ames, February, 2014
31. "Large-Scale Structured Optimization: Algorithms and Applications", *NJIT*, Newwark, February, 2014

32. "Large-Scale Structured Optimization: Algorithms and Applications", *University of Massachusetts*, February, 2014
33. "Large-Scale Structured Optimization: Algorithms and Applications", *Texas Tech University*, Lubbock, January, 2014
34. "Base Station Activation and Linear Transceiver Design for Optimal Resource Management in Heterogeneous Networks", IMSE summer school on multi-angent systems, *University of Illinois at Urbana-Champaign*, Aug. 2013
35. "Decomposition by Successive Convex Approximation: A Unifying Approach for Linear Transceiver Design in Heterogeneous Networks", *Zhejiang University*, June. 2013
36. "Large-Scale Structured Optimization: Algorithms and Applications", Special Seminar, *University of Virginia*, April 2013
37. "Joint Base Station Clustering and Transceiver Design in Heterogeneous Networks", *Asilomar Conference on Signal, System and Computers*, November 2013
38. "Decomposition by Successive Convex Approximation: A Unifying Approach for Linear Transceiver Design in Heterogeneous Networks", Communication, Control and Signal Processing Seminar, Digital Technology Center, University of Minnesota, October 2012
39. "A Primal-Dual Algorithm for Simulation–based Computation of Cournot Equilibrium in Electricity Market", *International Symposium for Mathematical Programming (ISMP)*, Chicago, August 2009

POST DOCTORAL SCHOLAR ADVISED

- Dr. Qingjiang Shi

  Iowa State University, IMSE Department

  From Jan 2016 – March 2017

  Associate Editor for IEEE Transactions on Signal Processing, 2017 – 2020

GRADUATE STUDENTS ADVISED

- Davood Hajinezhad

  Iowa State University, IMSE Department

  Ph.D. obtained December 2017

  Recipient of **Graduate College's Research Excellence Award** at Iowa State

  First job: Post-Doctoral Fellow at Duke University

- Songtao Lu

  Iowa State University, ECE Department

  Ph.D. expected June 2018

  Joint advised with Zhengdao Wang

  Recipient of **Graduate College's Research Excellence Award** at Iowa State

- Haoran Sun

  University of Minnesota, ECE Department

  Ph.D. expected June 2020

  Recipient of **Presidential Fellowship** at Iowa State

- Yijian Zhang

  Iowa State University, IMSE Department

  Ph.D. expected June 2020

- Mostafa Amin-Naseri

Iowa State University, IMSE Department

Ph.D. expected June 2020

Joint advised with Stephen Gilbert

- Xiangyi Chen

  University of Minnesota, ECE Department

  Ph.D expected June 2020

UNDERGRADS ADVISED

- Andre Fristo

  Iowa State University, IMSE Department

  B. Sc., expected June 2018

- Chase Grimm

  Iowa State University, IMSE Department

  B. Sc., expected June 2018

Departmental Committee

- Curriculum Committee, ECE Department, University of Minnesota (2017 - 2018)
- Curriculum Committee, IMSE Department, Iowa State University (2014 - 2017)
- Faculty Search Committee, IMSE Department, Iowa State University (2016 - 2017)

PROFESSIONAL MEMBERSHIP AND SERVICES

- IEEE, IEEE Signal Processing Society member
- INFORMS, SIAM member
- Member, IEEE Signal Processing Society SPCOM Technical Committee (2017-2020)
- Member, IEEE Signal Processing Society MLSP Technical Committee (2018-2021)
- Organizer of invited sessions
  - INFORMS 2015, 2016, 2017
  - Asilomar 2016
  - SPAWC 2018 special session on "Machine Learning for Communications"
- Technical Program Co-Chair
  - GlobalSIP 2016, 2017, Symposium on "Distributed Optimization and Resource Management over Networks"
- TPC member
  - IEEE SmartGridComm 2014, IEEE GlobalSIP 2015, IEEE GameNets 2016, AISTATS 2017, ICC 2018, SPAWC 2017, 2018
- Peer Review Activities
  - IEEE Transactions on Automatic Control
  - IEEE Transactions on Wireless Communications
  - IEEE Transactions on Communications
  - IEEE Transactions on Mobile Computing
  - IEEE Journal on Selected Areas in Communications
  - IEEE Transactions on Vehicular Technology
  - IEEE Transactions on Signal Processing

- IEEE Transactions on Information Theory
- IEEE Transactions on Information Forensics and Security
- IEEE Signal Processing Letters
- IEEE Communication Letters
- IEEE Wireless Communication Letters
- IEEE Access
- IEEE Transactions on Control of Network Systems
- IEEE Transactions on Networking
- IEEE Network Magazine
- EURASIP Journal on Wireless Communications and Networking
- SCIENCE CHINA Mathematics
- Mathematical Programming
- SIAM Journal on Optimization
- Optimization Methods and Software
- Operations Research
- Computational Optimization and Application
- IEEE Access
- IEEE Transactions on Control of Network Systems
- IEEE Transactions on Networking
- Mathematics of Operations Research
- Journal of Scientific Computing
- Journal of Global Optimization